

MACHINE FOR DECORATING A FOOD PRODUCT, IN PARTICULAR A
CAKE, WITH AN INGREDIENT IN GRANULAR FORM

Technical field

The present invention relates to a machine for
5 decorating a food product, in particular a cake, with an
ingredient in granular form.

The machine forming the subject of the present
invention may be advantageously used in the food sector
for distributing various types of ingredients in granular
10 form, such as granulated almond, chocolate or coconut
flakes, icing sugar or the like, onto substantially
vertical or oblique portions of food products, in
particular cakes or other confectionary items.

"Ingredient in granular form" is understood as
15 indicating generally any type of food ingredient which is
fragmented or formed into minutes particles of any shape
and size.

Background art

As is known, a type of decoration which is widely
20 used for cakes or for similar confectionary products
consists in ingredients in granular form distributed over
parts of cakes previously coated, for example, with a
layer of cream.

Distribution may be performed both on the top
25 portion of the cakes and on the side portion thereof.

Application of the granular ingredients onto the top part of the cakes does not require any special operations since it is easy to perform. Application, however, of this type of ingredient onto side portions of the cake which are generally vertical or in any case inclined is more difficult since it requires good manual skill and expertise.

In some cases, moreover, it is required to perform distribution solely over the sides of the cake, leaving the top part free of the granular ingredient.

At present, also in the case of production on an industrial level, this type of decoration is performed mainly by means of manual operations and more rarely using semi-automatic systems, which nevertheless require dedicated and specialized labour.

Traditionally, an operator uses, for manual distribution of these granular ingredients on the cakes, a simple device provided with a tray for collecting the granular ingredient. An idle rotating plate is situated in the centre of this tray, on top of a support stem, and receives a cake to be decorated, arranged on top. The operator turns the cake with one hand and with the other hand picks up a certain quantity of granular ingredient from the tray and moving his/her hand closer fills up the sides of the cake with this ingredient so that the cake,

during its rotational movement, incorporates part of this ingredient into the outer layer coated with a layer of cream.

5 The drawback of this method lies mainly in the high cost of the labour together, generally, with the low productivity of this type of processing operation.

Also known is a system for distributing ingredients in granular form (referred to below as "granular product") which envisages performing the operation in an automatic manner directly along the line for production of the cakes to be decorated. The cakes are transported on a transportation line close to a large mound of granular product so that they are able to interfere with it tangentially. The transportation line consists of two conveyor belts which are arranged alongside each other and travel at different speeds. The cakes are positioned halfway between the two belts so that the difference in speed between the two belts causes rotation of the said cakes so that the entire side surface of the cakes may come into contact with the mound of granular product. The latter is usually situated alongside the slower conveyor belt.

20 This automatic system has numerous drawbacks. Firstly, with said system it is possible to obtain only a band of granular product with a limited and non-uniform

height since the mound of granular product is unable to provide a vertical wall of granular product facing the cake. Secondly, large quantities of granular product fall from the cakes, also as a result of the movement of the conveyor belt, with the consequent need for recovery and recycling of the said granular product. In addition, the granular product which is not incorporated in the layers of cream of the cakes or which falls to the ground may be soiled and thus be difficult to recycle.

Disclosure of the invention

In this situation, therefore, the object of the present invention is to eliminate the drawbacks of the prior art mentioned above, by providing a machine for decorating a food product with an ingredient in granular form which allows a uniform distribution of granular product on the side surface of the food product.

A further object of the present invention is to provide a machine which is able to decorate food products, and in particular cakes, of any height.

Another object of the present invention is to provide an automated machine to be inserted along a line for the production of cakes or similar products.

These and other objects are all achieved by a decorating machine according to the accompanying claims.

Brief description of the drawings

The technical features of the invention, in accordance with the abovementioned objects, may be clearly determined from the contents of the claims included below and the advantages thereof will emerge more clearly from the detailed description which follows, provided with reference to the accompanying drawings which show a purely exemplary and non-limiting embodiment thereof in which:

- Figure 1 shows a partially sectioned overall view of the machine according to the invention;

- Figure 2 shows a top plan view of the machine according to the invention with some parts removed so that other parts are more clearly visible;

- Figure 3 shows a top plan view of the means for distributing ingredients in granular form according to the invention;

- Figure 4 shows a side view of the distribution means according to the invention.

Detailed description

For the sake of convenience and simplicity of description, below reference will be made to a cake T, for the food product to be decorated, and to a granular product G, in particular consisting of almonds, for the ingredient in granular form. The reference to a cake T

must not be regarded as limiting, since the cake T in reality may be a food product of any type and form, such as for example pies or pastries. The same is also applicable to the reference to granulated almonds which in reality may be replaced by an ingredient in any particle form which can be used for decoration, such as for example chocolate or coconut flakes, icing sugar and the like.

With reference to Figures 1 to 4, 1 denotes in its entirety a machine according to the invention for decorating a food product, in particular a cake T, with an ingredient in granular form such as, for example, granulated almonds G.

Such a machine 1 has firstly a support structure 2.

With reference to the embodiment illustrated in Figure 1, the support structure 2 consists of a first framework 21 and a second framework 22, which are both formed by four support columns 23 which are arranged at the corners of a quadrilateral and are connected together by horizontal cross-members 24. The support columns 23 rest on the ground by means of adjustable feet 25.

Distribution means 3 are mounted on the first framework 21 so as to generate a uniform flow of granular product G suitably directed onto the surface of the cake T to be decorated, in a direction Y which is preferably

horizontal.

In more detail, according to the embodiment illustrated in the accompanying figures, the means 3 for distributing the granular product G consist of a rotor 31 which is operated by first motor means 32 via flexible transmission means 33, such as for example a belt or a chain.

The rotor 31 is mounted on a first horizontal surface 26 supported by the first framework 21 and is operated by the first motor means 32 which are also fixed to the same framework 21.

This rotor is seated inside a housing 34 which has a delivery mouth 35 for forming a flow of granular product G and an opening 36 for supplying the rotor with the said granular product G. The rotor is provided with a plurality of radial blades 37 which, in accordance with the embodiment shown, are four in number. In Figures 3 and 4 it can be seen in detail that these radial blades 37 are each formed with a first portion 38, which extends along the lie of a radial plane parallel to the axis of rotation, and second portion 39 which is inclined with respect to the first portion, with a different inclination and orientation of the adjacent blades. The different orientation of the adjacent blades of the second portions 39 produces an intense vortical effect

inside the said rotor 31, thus allowing the generation of a uniform flow along the whole extension of the delivery mouth 35.

5 The second framework 22 has, mounted at the top, a support base 4 intended to support the cake T which must be decorated with the granular product G in the vicinity of the abovementioned distribution means 3.

10 Movement means 5 integral with the said second framework 22 and mechanically connected to the support base 4 are also envisaged, thereby producing a substantially vertical rotational movement Z preferably perpendicular to the direction Y of the flow of granular product G.

15 In more detail, the means 5 for moving the support base 4 comprise translation means 6 and rotation means 7.

20 The translation means 6 move the support base 4 between a rest position, where the cake T may be loaded or unloaded onto/from the said support base 4, and an operating position where the cake T is situated in the vicinity of the distribution means 3 and therefore in such a way as to interfere with the flow of granular product G produced by said means.

25 The rotation means 7 cause rotation of the support base 4 and therefore the cake T loaded onto it. Preferably the rotation means 7 impart the rotational

movement to the support base 4 only when it is in the operating position defined above. By means of several turns of the support base 4, the entire surface of the cake T may be exposed several times to the flow of granular product G, obtaining moreover an improved distribution of the granular product G over the said surface.

According to the preferred embodiment illustrated in the accompanying figures, the translation means 6 consist of a pneumatic actuator 61 comprising a central transmission shaft 62 connected at the top to the support base 4.

As can be seen in Figure 2, the support base 4 is in particular formed by four arms 41 which are arranged in the form of a cross and connected at one end to the top of the central shaft 62 and which define a second horizontal surface 27 basically also supported by the second framework 22.

The rotation means consist of second motor means 71 actuating a hollow shaft 72 provided internally with a guide 73. The central shaft 62 which is connected to the support base 4 slides coaxially with said hollow shaft 72. A longitudinal key 63 with a shape corresponding to that of the guide 73 is formed projecting from the central shaft 62. The key 63 extends along the hollow

shaft 72 by an amount sufficient to ensure continuity of engagement with the guide 73 in any operating condition. Owing to engagement of the key 63 inside the guide 73, the hollow shaft 62 transmits the rotational movement produced by the second motor means 71 to the central shaft 62 and, therefore, to the support base 4.

Advantageously, the distribution means 3 of the machine 1 according to the present invention can be moved by kinematic means 8 so as to assume several supply positions along surface portions of the cake T so as to be able to sprinkle the granular product G either over the whole surface of the cake T or only over some portions thereof, such as for example its side surface or its top surface.

In the embodiment which is shown in the accompanying figures, the movement of the distribution means 3, which in case in question are represented by the rotor 31, consists in a substantially vertical translation parallel to the side surface of the cake T so as to sprinkle the granular product G over at least one portion of this side surface or over the whole side surface by means of several passes with the distribution means at different heights.

In more detail, the kinematic means 8 consist of at least one linear actuator 81 which is actuated by third

motor means 82 and is mechanically associated with the first horizontal surface 26 on which the rotor 31 is in turn mounted.

Advantageously the distribution means 3 are able to
5 be moved towards or away from the side surface of the cake T by means of adjustable positioning means (not shown in the accompanying drawings), such as for example spacer elements which are arranged between the two frames 21,22 and define the relative position of the
10 distribution means 3 on the first horizontal surface 26 and of the cake T on the support surface 4.

Advantageously, the machine 1 according to the present invention is provided with a screening element 9 for protecting the top surface of the cake T from the
15 flow of granular product generated by the distribution means 3 and with adjusting means operating said screening element so as to vary the screened surface of said cake T.

In the embodiment of the machine 1 according to
20 Figure 1, the screening element 9 consists of a box-shaped structure 91 provided with an opening 92 which is able to receive said cake T from the side of its top surface. The box-shaped structure 91 is supported by a frame 93 above the support base 4 in a position which is
25 adjustable heightwise and horizontally by means of a

first vertical arm 94 and a second horizontal arm 95 of the frame 93.

As can be seen in Figure 1, the granular product is supplied to the distribution means 3 by means of a system for supplying the granular product G, which consists of a hopper 50 and a conveying channel 51. The latter is connected at a first end to the hopper 50 and at its second end to the rotor 31.

In more detail, according to the embodiment illustrated, the conveying channel 51 is a vibrating surface which causes the granular product G to fall into funnel 52 connected to the opening 36 supplying the said rotor 31.

The granular product which does not manage to adhere to the surface of the cake T is recovered by a collection system which consists, in particular, of at least one extractable drawer situated underneath the support base 4.

The machine 1 according to the present invention may advantageously be used along a line for production of cakes T. Upstream of the machine 1 it is possible to envisage, for example, a station for assembly of the basic ingredients of the cakes and a station where spreading of a layer of creamy preparation on the side surface of the cakes is performed. Downstream it is

possible to envisage, for example, other stations for completing decoration or also solely for packing the said cakes.

For this purpose, the machine 1 is provided with transportation means, for example conveyor belts, for conveying the cake T between said stations and in particular from an entrance opening 101 to an exit opening 102 (shown in Figure 2) of the machine in question, causing said food product to pass in the vicinity of the means 3 for distributing the granular product G.

The support base 4 is able to receive from or transfer to said transportation means the cake T when it is located in the abovementioned rest position. As can be seen in Figure 2, in this rest position the arms 41 of the support base 4 are inserted in the free spaces existing in the parallel-belt structure of the conveyor 100.

The cake T is stopped when it is above the support base 4 by stopping means (not shown in the Figures). These stopping means are formed, for example, by an engaging element which projects from the conveyor belt 100 when the cake T arrives and retracts when the cake T must pass through the exit opening. Alternatively a proximity sensor may be usefully used.

The support base 4 is raised with respect to said transportation means when it is in the operating position. In this position the arms 41 do not interfere with the transportation means and in particular with the conveyor belt 100 during their rotational movement.

Advantageously a system for controlling operation of the machine 1 is envisaged, said system being based on a PLC (Programmable Logic Controller) which controls operation of the various devices in accordance with controlled operating steps.

The PLC basically coordinates the various operating steps of the machine 1.

When the cake T passes through the entrance opening, the PLC activates the stopping means which stop the cake T above the support base 4 in the rest position and at the same time interrupts the movement of the conveyor belt 100.

At this point the translation means 6 are firstly activated so as to bring the support base 4 into the operating position, followed by activation of the rotation means 7 which cause it to rotate.

At this point the distribution means 3 are activated so as to generate the flow of granular product G onto the side surface of the rotating cake T.

The PLC then activates kinematic means 8 which

displace the distribution means 3 with respect to the side surface of the cake T.

Once distribution of the granular product G onto the cake T has been completed, rotation of the support base 4 is stopped and the latter returns into the rest position.

The PLC deactivates the stopping means and reactivates the conveyor belt which picks up the cake T from the support base 4 and causes it to pass through the exit opening towards any operating stations situated downstream.

With the machine according to the invention it is possible to decorate the side surface of cakes of any height owing to the possibility of varying the position of the distribution means along the whole extension of the side surface of the cake T.

The distribution means are also able to ensure a highly uniform distribution of the granular product over the whole portion of the side surface being processed, thus reducing the quantity of granular product to be recycled.

The machine is very flexible in terms of its operation and is able to incorporate the operation of decorating the side surface of cakes within automated production lines.